

TH320

Thermal Printer

Users Guide



Edition May 2010

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Contents

- Manufacturer’s Declaration and Approval1**
 - General Authorization1
 - FCC-Class A Declaration1
 - User Information1
 - Safety Information2
 - Instructions for Maintenance3
 - Warranty3
 - Recycling3
 - Voluntary Control Council for Interference (VCCI)
 - Radio Frequency Interference Statement4

- About This Guide5**
 - What is in this guide5

- About the Printer6**
 - User Controls8
 - Audible Beeps9
 - Available printer configurations9
 - Printer configuration identification9
 - Communication interfaces9
 - Printer Specifications10

- Setting up the Printer12**
 - Getting Started12
 - Choose a location12
 - Unpack the printer13
 - Keep the packaging13
 - Check the packing list14
 - Removal of internal restraint items14
 - Installing new receipt paper15
 - Installing or replacing the ribbon cassette16
 - Replacing a used ribbon cassette16
 - Installing a new ribbon cassette17
 - Connect the cables18
 - Cash drawer cables18
 - Communication cables19
 - If installing the USB communication cable20
 - If installing the Powered USB cable20
 - Power supply cable21
 - Cable routing22

Testing the printer	22
Test Procedure	23
Test Printout	24
Printer configurations	25
Configuring the printer	26
Communication interface	28
Diagnostic modes	30
Enable or disable data scope mode	30
Enable or disable receipt test mode	31
Enable or disable slip test mode	31
Enable or disable MICR test mode	32
Setting the printer emulations and software options	33
Slip Options	33
Setting Up the Printer	34

Using the Printer36

Printing on forms or checks	36
Front insertion method	36
Dropin method	37
Proper insertion of multi-partforms	37
Verifying and validating checks (optional)	39
Tips for Avoiding Problems	41
Prevent over heating of the printhead	41
Avoid Harsh Environments	42

Troubleshooting43

Status Indicators	43
Typical Remedy Procedure	43
Printer beeps	44
Printer will not print	44
On-line, paper status, error light flashes	45
Slip-inlight does not operate	46
Check print quality poor	46
Receipt print quality poor	47
Slip station and MICR problems	48
The knife does not operate	49
Other conditions	50

Manufacturer's Declaration and Approval

General Authorization



The device complies with the requirements of the directive 2004/108/EC with regard to "Electromagnetic compatibility" and 2006/95/EC "Low Voltage Directive". Therefore, you will find the CE mark on the device or packaging.

FCC-Class A Declaration

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Modifications not authorized by the manufacturer may void users authority to operate this device.

This class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.



Additionally, the TH320 has received the cUL and UL approval.

User Information

Wincor Nixdorf International GmbH does not accept responsibility for radio and TV interference and faults that are caused by unauthorized changes

SAFETY INFORMATION

that have been made to the devices. Furthermore, cables or other devices that have not been approved by Wincor Nixdorf may not be connected to the device. The user is responsible for any faults and interference that are caused as a result.

Repair work on the devices should only be carried out by authorized and specially trained personnel. Improper repairs will lead to the loss of any guarantee and liability claims.

Extension boards with electrostatically endangered components can be identified with this label.

Safety Information

This device conforms to the corresponding safety regulations for information technology devices, including electronic office machines for use in the office environment. Connect only WN approved power supplies.

- If the device is moved from a cold environment to a warmer room where it is to be operated, condensation could occur. The device must be completely dry before being put into operation. Therefore an acclimatization time of at least two hours should be accounted for.
- Lay all cables and supply lines so that nobody can tread on them or trip over them.
- Data cables should neither be connected nor removed during electrical storms.
- Protect the device from vibrations, dust, moisture and heat, and only transport the device in its original packaging (to protect it against impact and blows).
- Take care to ensure that no foreign objects (e.g. paper clips) or liquids can get into the inside of the device, as this could cause electrical shocks or short circuits.
- In case of emergencies (e.g. damaged housing, liquid or foreign objects getting into the device), the device should be switched off immediately.
- Generally you should connect IT-devices only to power supply systems with separately guided protective earth conductor (PE), known as TN-S networks. Do not use PEN conductors! Please also observe the recommendations of the norm DIN VDE 0100, part 540, Appendix C2, as well as EN50174-2, §5.4.3.

Instructions for Maintenance

Clean your TH320 regularly with an appropriate surface cleaning product. Make sure that the device is switched off, connector cables are unplugged and that no moisture is allowed to get into the inside of the device.

Please observe the maintenance and cleaning instructions for each of the TH320 components. These instructions can be found in their respective chapters.

Warranty

Wincor Nixdorf guarantees generally a warranty engagement for 12 months beginning with the date of delivery. This warranty engagement covers all those damages which occur despite a normal use of the product.

Damages because of

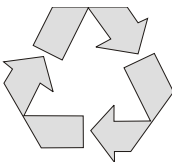
- improper or insufficient maintenance,
 - improper use of the product or unauthorized modifications of the product,
 - inadequate location or surroundings
- will not be covered by the warranty.

For further information of the stipulation look at your contract.

All parts of the product which are subject to wear and tear are not included in the warranty engagement.

Please order spare parts at the Wincor Nixdorf customer service.

Recycling



Environmental protection does not begin when the time has come to dispose of the TH320; it begins with the manufacturer. This product was designed according to our internal norm "Environmental conscious product design and development".

The TH320 is manufactured without the use of CFCs und CCHS and is produced mainly from reusable components and materials. The processed plastics can, for the most part, be recycled. Even the precious metals can be recovered, thus saving energy und costly raw materials.

RECYCLING

Please do not stick labels onto plastic case parts. This would help us to re-use components and material. You can protect our environment by only switching on your equipment when it is actually needed. If possible, even avoid the stand-by-mode as this wastes energy, too. Also switch your equipment off when you take a longer break or finish your work.

Currently at present, there are still some parts that are not reusable. Wincor Nixdorf guarantees the environmentally safe disposal of these parts in a Recycling Center, which is certified pursuant to ISO 9001.

So don't simply throw your TH320 on the scrap heap when it has served its time, but take advantage of the environmentally smart up-to-date recycling methods!

Please contact your competent branch for information on how to return and re-use devices and disposable materials.

Voluntary Control Council for Interference (VCCI) Radio Frequency Interference Statement

This is a Class B product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

About This Guide

What is in this guide

The four chapters that follow are organized according to what you want to learn about the printer, learn about the set up, operation, and routine testing and servicing of the printer.

- Chapter About the Printer
 - What the printer does
 - How it communicates
 - Operator controls
 - Standard features
 - General Specifications
- Chapter Setting up the Printer
 - Preparing for installation
 - What comes with the printer
 - Packaging
 - Connecting the printer to the system
 - Configuring the printer for your needs
 - Testing the printer
- Chapter Operating the Printer
 - Printing on forms or checks
 - Verifying and validating checks
 - Clearing paper jams
 - Tips for preventing problems
- Chapter Troubleshooting and Service
 - Error signals visual and audible
 - Finding and solving printer problems
 - Technical support

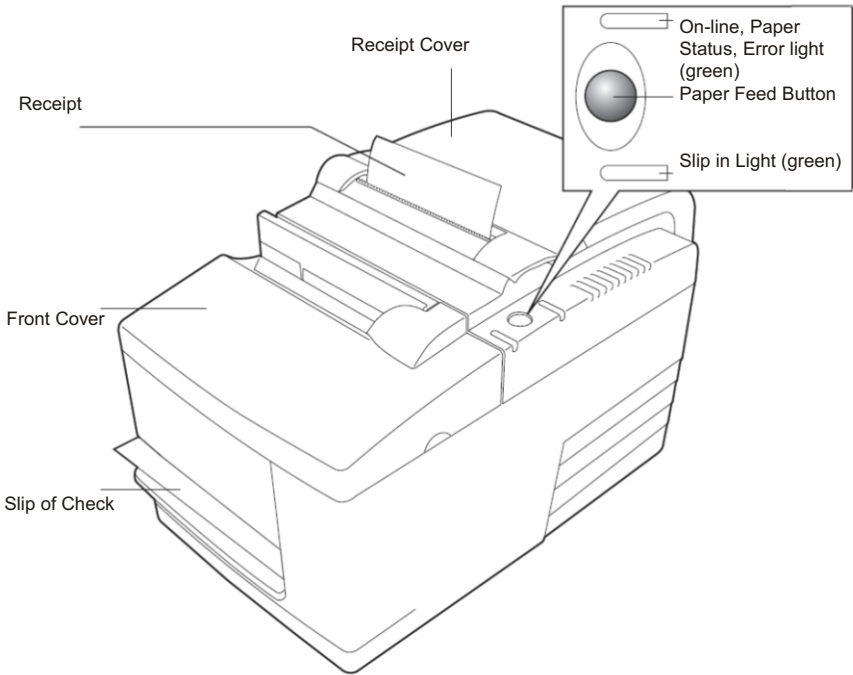


Notes in the manual are marked by this symbol.



This symbol is used for warnings.

About the Printer



The TH320 is a low-cost, high-efficiency, point-of-sale (POS) printer that boasts the smallest footprint of any hybrid printer. It features fast monochrome or two-color receipt printing plus a drop in validation print station. The TH320 provides maximum flexibility, performance, and reliability.

It consists of two specialized printers in one compact package: a two-color thermal printer on top that prints receipts, and an impact slip printer to print on forms and checks that you insert. Built-in MICR check reading or validation is an optional feature of the TH320 printer.

The TH320 fits easily in spaces where no other hybrid printer can and connects to most host computers via the 25-pin RS-232 interface or USB or PoweredUSB interface.

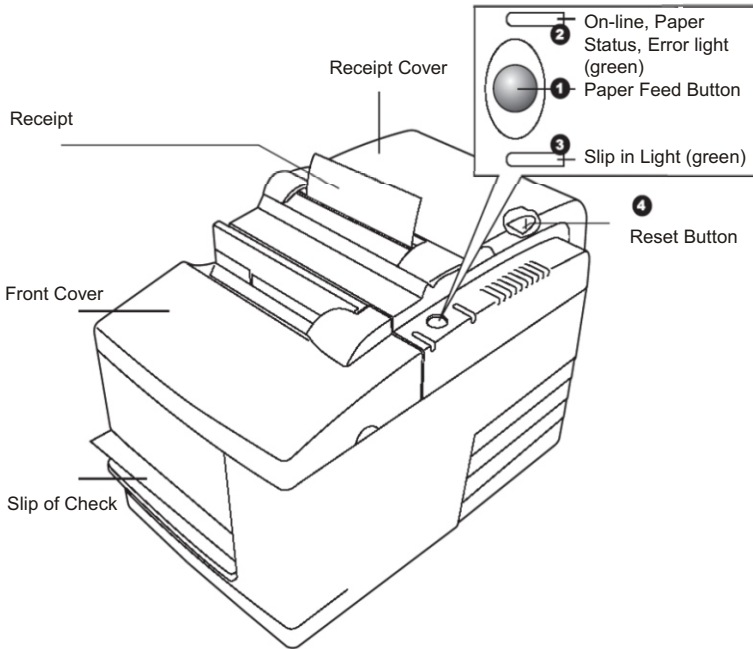
The printer's standard command set allows it to work with software written for Wincor Nixdorf or other compliant printers. A variety of sensors enables the printer to communicate its status to the host computer. The printer also has an electronic journal feature.

The easy-to-use thermal printer requires no ribbon or ink cartridge. Load new paper by simply opening the receipt cover and dropping in a new roll.

The impact printer provides the power and flexibility to print on checks or multi-part forms up to four plies, in a wide variety of sizes and orientations.

This section describes the printer's features and options in more detail.

User Controls



The printer has the following controls:

The Paper Feed button (1) advances the receipt paper and is used in navigating configuration menus.

The On-line, Paper Status, Error light (2) shows the printer status by shining or flashing.

The slip-in light (3) indicates that a form is inserted properly.

The reset button (4) clears the printer's memory and resets the printer.

Audible Beeps

After power is applied or after reset, the printer normally emits a single beep. This indicates that the printer has successfully completed its startup and self-test routine.

If, after startup or reset, the beeping continues in a single, double, or triple pattern, an internal failure has occurred. Please call your service representative.

Available printer configurations

There are several configurations of the printer, depending on the combination of desired options.

Printer configuration identification

See the sample below to determine the printer configuration. The printer configuration identification (model ID) is located on the model label attached to the back of the printer. This information is also shown on the installation quality report card. The model ID description is shown below.

Communication interfaces

- RS-232C serial interface (25-pin)
- Universal Serial Bus (USB)
- Powered USB

Printer Specifications

Printer Output		
	Receipt Station	Slip Station
Print Method	Direct Thermal, 203 DPI	9-Pin Impact
Character Cell Size	13 X 24, 10 X 24	7 X 7, 12 X 7, 5 X 9
CPI	15.6 & 20.3	13.9 & 16.8
Print Columns	44 & 56	42 & 51
Print Line Width	72 mm (2.8 in.)	76.8 mm (3.02 in.)
Printing Speed	Monochrome 80 LPS (250 mm/sec)* Color 29.6 LPS (100 mm/sec)	4.8 LPS
Character Sets	Page 437, 737, 850, 852, 858 (with Eurosymbol), 860, 862, 863, 865, 866, and 1252 (Expanded character sets available)	
Bar Codes	UPC-A, UPC-E, Code 39, Code 93, Code 128, JAN8 and JAN13 (EAN), Interleaved 2 of 5, Codabar, PDF 417 (receipt station only) GS1 DataBar	
Auto Cutter	Partial Cut, leaves 5mm uncut on left edge	
MICR Reader (option)		
Character sets/fonts	E-13B and CMC-7, auto discriminate (Integrated in slip station)	
Check Read Rate	99% minimum	
Parsing Formats	E-13B only. Programmable to any format	
Physical		
Dimensions (W x D x H)	165.10 mm x 289.56 mm x 167.64 mm (6.5 in. x 11.4 in. x 6.6 in.)	
Weight	ca. 3.6 kg (approximately 8 pounds)	
Power Requirements	24 VDC, 3 Amps	
Software and Firmware Capability		
Emulations Available	Application Compatible Escape Commands (ACEC) A756	
Data Buffer	8K	

* as of serial number K06440000, former values:180 mm/sec (59 LPS)

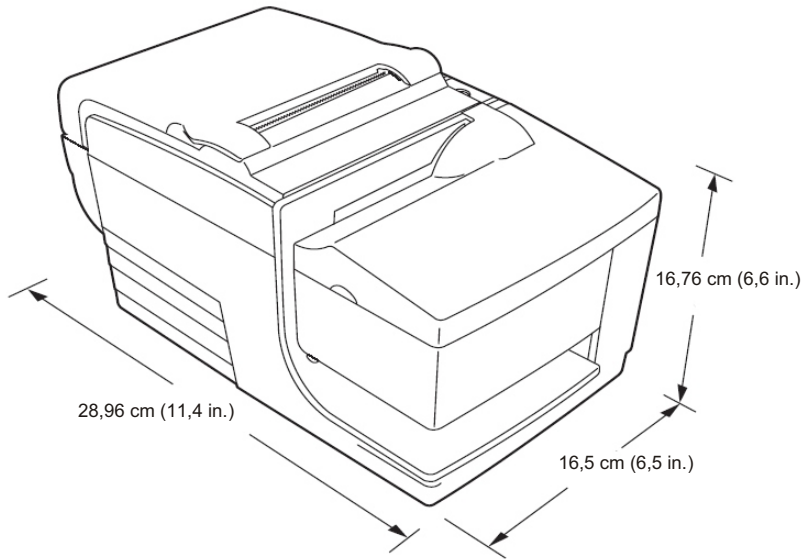
PRINTER SPECIFICATIONS

User Memory	2 to 12 MB: (optional) shared for graphics, logos, user defined characters, user data storage, and electronic journal
Communication	Board Architecture supports: 25-pin RS232, USB, Powered USB
Printer Drivers	OLE POS for Windows XP and XP embedded, Java POS, USB
Thermal Paper Requirements	
Paper Type	Direct Thermal, POS Grade(s), special requirements for color printing
Paper Roll (W x Dia.)	80 mm x 83 mm (3.15 in. x 3.27 in.)
Impact Slip Forms Requirements	
Size	69.85 mm x 127.00 mm (2.75 in. x 5.00 in.) minimum front & side
Maximum Length	279.4 mm (11.00 in.)
Number of Plies	1 - 4 ply multipart
Miscellaneous	
Certifications	EMC emissions: EN55022:1998 Class B ITE emission requirements (EU); FCC 47 CFR Part 15, Class B emissions requirements (USA), VCCI Class B ITE emissions requirements (Japan); AS/NZS 3548:2002/CISPR22 Class B ITE emission requirements (Australia); EMC Immunity: EN55024:1998/A1:2001 Information technology equipment (EU)
Reliability	Thermal Print Mechanism; 200 KM paper (59M lines) monochrome, 100 KM twocolor (53 M lines), Auto Knife Cutter; 1.5M cuts Impact Print Mechanism; 15 M lines Impact Printhead; 200M characters, MICR reader; 200,000 Reads
Paper Thickness	0.014 in. maximum (0.35 mm)

Setting up the Printer

Getting Started

Before setting up the printer, be sure you read and understand each of the sections in this chapter. The sections are presented in the sequence that they should be performed.



Choose a location

The TH320 printer being only 16,5 cm (6.5 inches) wide requires very little counter space and may be set on or near the host computer. With the RS-232C interface, you can place the printer up to 15 m (50 feet) (with the USB interface up to 5 m (15 feet), PoweredUSB 3.8 m (12.5 feet) from the BEETLE/host computer and power supply.

Do not place the printer in any dusty environment or anywhere that spillage of drinks or other liquids can occur.

Place the printer on a level surface, and make sure there is enough room to open the receipt cover to change the paper and to open the front cover to change the impact printer's ribbon cassette.

Devices such as CRT monitors or large metal surfaces can affect the printer's magnetic field and cause intermittent check reading errors. Be sure to locate the printer away from such sources of interference.

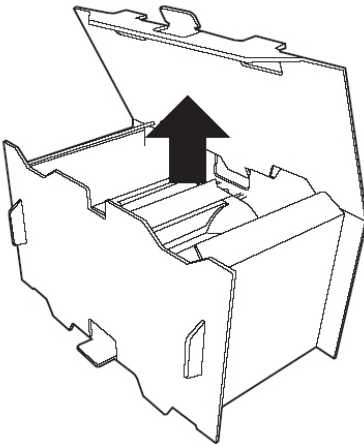
Be sure to leave adequate space at the rear of the printer for connecting and accessing the cables.

If the printer has a built in Magnetic Ink Character Recognition (MICR) check reader, you may need to make additional adjustments to the printer's location.

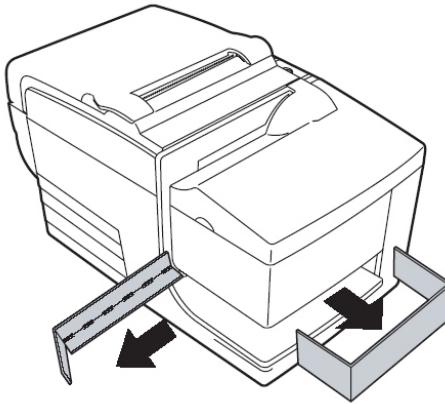
Unpack the printer

Keep the packaging

The packing materials protect the printer and help prevent damage. Be sure to save all the packaging materials -including the cardboard supports in the slip path.



UNPACK THE PRINTER



Remove and save the cardboard supports from the slip path after you have placed the printer in its user position.

Check the packing list

Before installation, check that all the items on this list are included (printers shipped in bulk may not include all these items):

- Printer (enclosed in a plastic bag with corrugated pack)
- Test printout protecting the printhead (inside receipt bucket)
- Cardboard support for cantilever (on slip table)
- Power supply with cable connecting to printer and power supply cord connecting to power outlet (only if ordered with the printer)
- Ribbon cassette
- Setup Guide

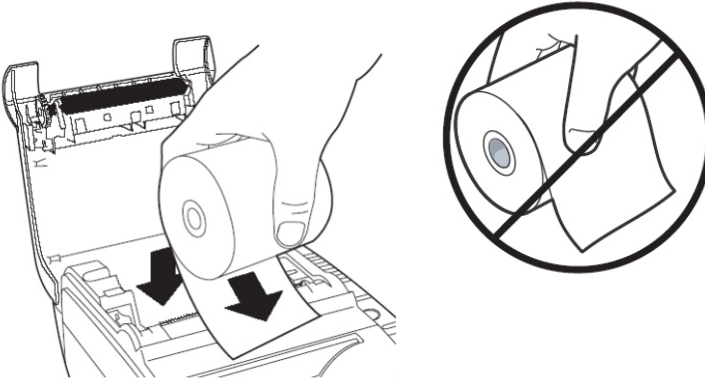
Removal of internal restraint items

Internal packing restraints within the printer provide protection against severe physical shock that occurs during shipment.

1. Remove these items only after placing the printer in its user position
2. Save all restraints and packaging materials for future use.

Having these packing materials on hand simplifies preparation of the printer for shipping or for long-term storage.

Installing new receipt paper



If the online paper status error light blinks, Change the paper as soon as convenient to avoid running out of paper part way through a transaction.

If the On-line, Paper Status, Error light blinks fast, the paper is out. Change the paper immediately or data may be lost. The printer can accept and store only a limited amount of data without paper. Memory overload can occur in the buffer, leading to a total loss of data.

If you are changing the type of paper (monochrome vs. two-color version or manufacturer type) send the "Set paper type" (1D 81 *m n*) command (description found in the "Programming Guide"). Refer to the "Set paper type" selection in the configuration menu. See the section on "Configuring the printer".

- Open the receipt cover and remove the used roll and core (if present).
- Tear off the end of the new roll so that the edge is loose.
- Place the roll into the paper bucket with the paper unrolling from the bottom of the roll, and with a few inches of paper extending over the cabinet front.



Paper must unroll from the bottom of the roll to insure that the image prints.

INSTALLING OR REPLACING THE RIBBON CASSETTE

- Close the receipt cover while holding the paper over the front of the cabinet.
- Remove the excess paper by tearing it against the tear-off blade.
- Press the paper feed button to advance the paper if necessary.

Installing or replacing the ribbon cassette

Change the impact printer's ribbon cassette if it is printing lightly or produces marks, lines or other inconsistent printing on the slip.



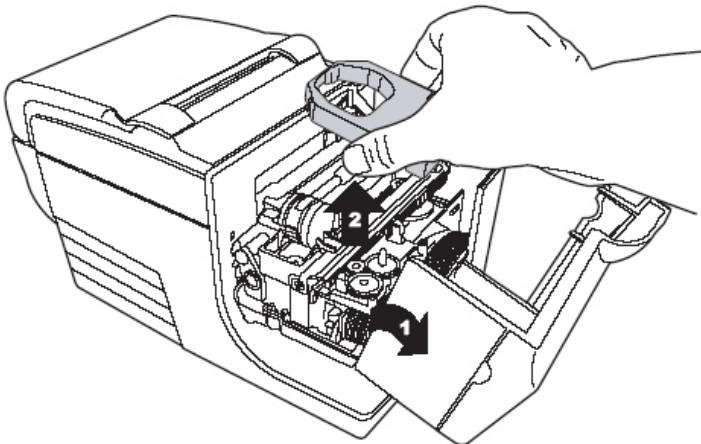
Use of other than an approved ribbon cassette can void all warranties and cause damage from jamming and other ribbon problems.

Replacing a used ribbon cassette

Open the front cover (1) by grasping the cover on each side near the top and swing toward you.

Pinch in tabs (2) of the old ribbon cassette and pull straight upward to remove it.

Continue to "Installing a new ribbon cassette" step 2.



Installing a new ribbon cassette

Open the front cover (1) by grasping the cover on each side at the bottom and swing up.

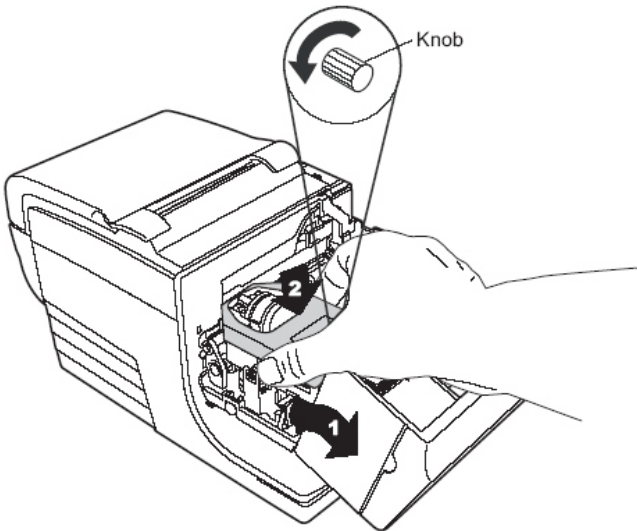
Unwrap the new ribbon cassette and tighten the ribbon by turning the knob on the cassette in the direction of the arrow.



DO NOT remove the transparent mylar shield that protects the exposed ribbon.

Position the ribbon cassette on the carriage, as shown (2), making sure the ribbon is not caught on the printhead.

Snap the cassette into place (2) and close the cover.



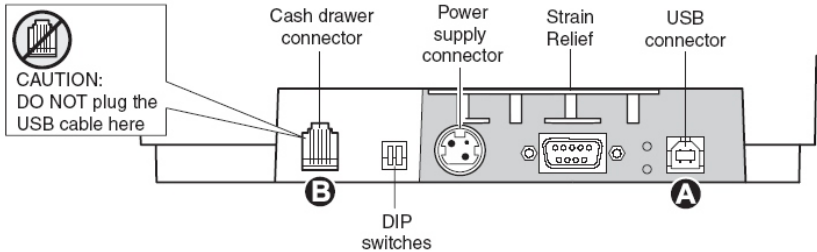
Connect the cables

Cable connections are made at the back of the printer.

The cash drawer cable connects the printer to one or two cash drawers.



Be careful to connect the USB cable only to point A (below). Attempts to connect the USB cable at point B can cause permanent damage to the communications circuitry.



Connector panel varies with printer configuration (25-pin serial and Powered USB connector versions not shown.)

Cash drawer cables

The cash drawer cable connects the printer to one or two cash drawers.

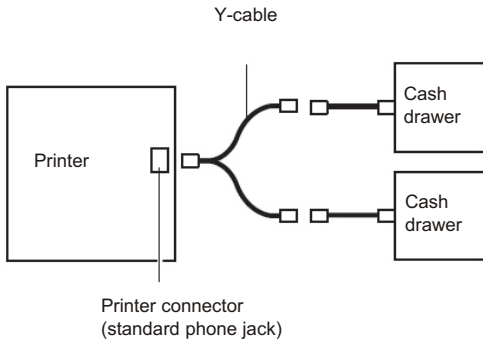


Be careful to connect correct cable into printer only at the cash drawer connector (B).

Plug the cable into the cash drawer connector (standard phone jack) located at the rear of the printer.

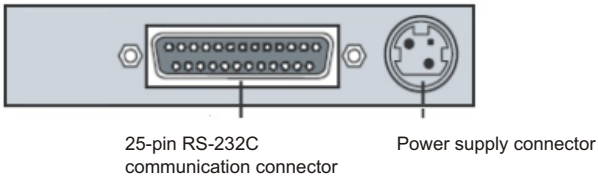


If your system has two cash drawers, attach a Y-cable to the printer's cash drawer connector as shown.



Communication cables

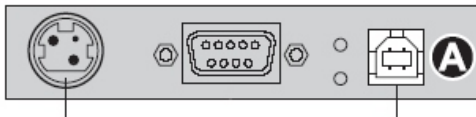
The communication cable connects the printer to the host computer.



- Turn off the BEETLE/host computer.
- Plug the communication cable into the connector at the bottom back of the printer.
- Secure the connector by tightening the screws.
- Connect the cable to the BEETLE/host computer.
- Turn host computer on.

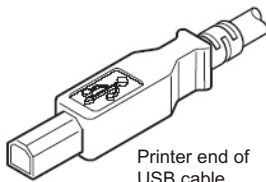
If installing the USB communication cable

USB communication connector panel

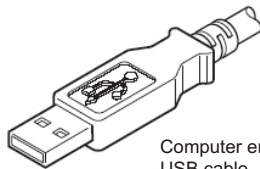


Power supply connector

USB connector



Printer end of
USB cable



Computer end of
USB cable

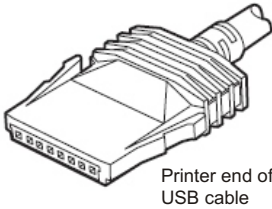
- Turn off the host computer.
- Plug the printer end of the USB cable into the USB connector port on the printer (A).
- Route the cable from the printer as shown on the following page to provide strain relief.
- Plug the computer end of the USB cable into the computer. Make sure the USB symbol on the connector is facing up when you plug it in.

After you have completed setting up the printer, you can install the USB driver onto the host computer.

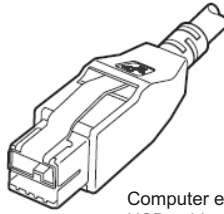
If installing the Powered USB cable



Powered USB connector



Printer end of
USB cable



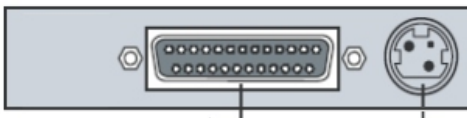
Computer end of
USB cable

- Be sure the host computer is powered off.
- Plug the printer end of the USB cable into the USB connector port on the printer.
- Route the cable from the printer as shown on the following page to provide strain relief.
- Plug the computer end of the USB cable into the computer.
- Plug the printer end of the Ethernet cable into the Ethernet connector port on the printer (A). Make sure the connector snaps firmly in place.
- Plug the computer end of the Ethernet cable into the Ethernet port of the computer. Make sure the connector snaps firmly in place.
- After you have connected the printer, you may need to set the printer internal parameters for Ethernet operation. See “Ethernet terminology and setup” section of the TH320 Programming Guide.

Power supply cable



To avoid damage to the printer, connect the power supply cable last.



25-pin RS-232C
communication connector

Power supply connector



Using this device without shielded cables voids the printer warranty, FCC and CE Mark designation.

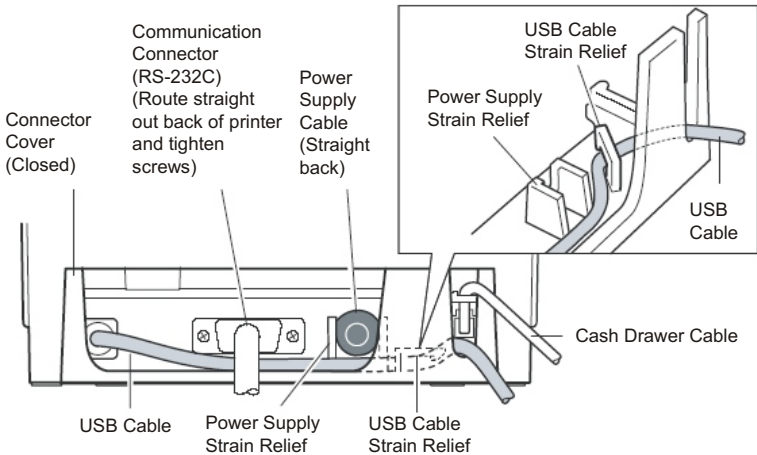
- Plug the power cord into the back of the printer.
- Route the cash drawer and power supply cables through the strain relief as shown in the next page, when the printer is configured for USB and the native “Cable routing”.

TESTING THE PRINTER

- Plug the power cord into the power supply, then plug the power supply into an outlet. The green light on the top cover will light up.

Cable routing

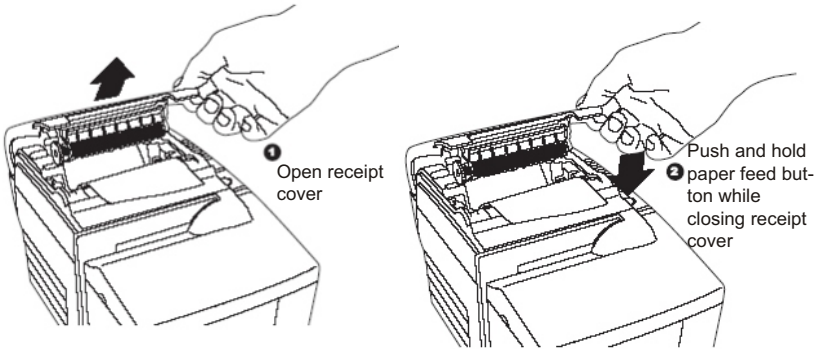
Prevent the printer from being accidentally unplugged by making sure the cables are routed as shown in the illustration below.



Testing the printer

This test prints a complete list of printer settings (Diagnostic form) and partially cuts the paper (see sample on next page). The test items listed may vary depending on the printer model. This printout is useful to a service representative when there is a problem. If the quality of the test printout is poor (missing or faded text) see the Troubleshooting section in this document.

Instructions at the end of the test printout describe how to enter the configuration menu. The configuration menu allows you to change the current settings of the printer.



Test Procedure

- To run the test, open the receipt cover (1); then, while holding down the paper feed button, close the receipt cover (2).
- When the printer begins printing let go of the paper feed button. The diagnostic printout will print.
- Review this printout for printer settings. If you wish to change any of these settings go to the configuration menu as instructed at the bottom of the printout.
- Make selections as instructed on the printout.



Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Test Printout

*** TH320 - Diagnostic Form ***

Model number : TH320-620S-W000
Serial number : K071900697

Boot Firmware
Revision : V1.22
CRC : 70CD
P/N : 189-7760753A

Flash Firmware
Revision : V2.00
CRC : 8910
P/N : 189-7760897A

H/W parameters
Flash Memory Size : 2 Mbytes
Flash Logos/Fonts : 960 kbytes
Flash User Storage : 64 kbytes
Flash Perm'nt Fonts : 0 kbytes
Flash Journal Size : 0 kbytes
SRAM Size : 512 kbytes
Head setting : F
Motor ID : 1
Paper Type setting : Type 0, Monochrome
Color Density Adj : n/a
Print Density, Mono : 100 %
Max Speed : 250 mm/sec
Paper Width : 80 mm
Max Power : 55 W
Paper Low Sensor : Enabled
MICR : Disabled
MICR Dual Pass : Disabled
Imager : Disabled
Slip Normal Alignmt : 07h/ 7d
Compressed Alignmt : 04h/ 4d

Comm. Interface
RX Buffer Size : 4096
Interface type : RS232C/USB
Parameters
Baud Rate : 115200
Data Bits : 8
Stop Bit : 1
Parity : ODD
Flow Control : DTR/DSR
Reception Errors : Ignore
USB Driver Type : Printer Class
USB Packet w/Error : Reject

Resident Code Pages : 437, 850, 852, 858
860, 863, 865, 866
1252, 862, 737, 857

Logo(s) defined : NO
User Char(s) defined : NO
Journal Unused : 0 kbytes

Diagnostics : OFF
Default Font : Standard
Printer Mode : Native Mode
Printer ID Mode : Native
Default LPI : 7.52
Carriage Return : Used as Print Cmd.
Resident Font Size : Standard
Wait for slip paper : Forever

Slip and Validation Options
Delete Lead Spaces : 0 Standard Columns
Delete Lead Spaces : 0 Compressed Columns
Compressed Mode : Disabled
Delete Trail Spaces : Disabled
Rotated Text Lines : 21
First Print Line : Slip Stop Emulation
Default LPI : 7.2
Validation Lines : 4
Cassette Cover Open : Enabled
Eject Position : Out Top

User Tallies
Recolot Lines : 5831
Knife Cuts : 123
Slip Lines : 288
Slip Characters : 10746
MICR Reads : 0
Hours ON : 31
Flash cycles : 2
Knife Jams : 0
Cover Openings : 11
Max Temp Reached : 36

To enter Printer Config Menu :
1) Flip DIP switch #1 down
2) Reset the printer, while holding
the Paper Feed button down

Paper type can be changed in the configuration menu. Paper types and grades available:

- Type 0 - Monochrome grades Kanzaki P-310
- Type 1 - Two-color grades Kanzaki P-310 RB
- Type 4 - Two-color grades Kanzaki P-320 BB
- Type 5 - Two-color grades Kanzaki P-320 RB

See the Programming Guide for more information.

Printer configurations

Printers are shipped with all the functions and parameters pre-set at the factory. Settings for various printer parameters can be changed. This menu is printed on the receipt and scrolls through instructions for selecting and changing user changeable functions or parameters.



Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

The following functions and parameters can be changed in the scrolling configuration menu (*except as noted):

- Communication Interface
 - RS-232C serial interface
 - Universal serial bus (USB)/Powered USB
- RS-232C serial interface settings
 - Baud rate
 - Data bits (*fixed at 8)
 - Stop bits (*fixed at 1)
 - Parity
 - Flow control
 - Hardware (DTR/DSR) or
 - Software (XON/XOFF)
- Data reception errors
 - Alternate DTR/DSR
- Diagnostic Modes
 - Normal
 - Datascope

CONFIGURING THE PRINTER

- Receipt test
- Slip test
- MICR test
- Check flip test

- Emulation/software options
 - Printer emulations
 - Printer ID
 - Receipt Options
 - Default lines per inch
 - Carriage return usage
 - Default font
 - Font size
 - Slip options
 - Hardware options sub-menu
 - Printhead setting
 - Paper type
 - Color density
 - Print density (mono)
 - Power supply wattage (max power)
 - Alternate reset feature
 - Paper low sensor
 - MICR
 - MICR dual pass option

Configuring the printer



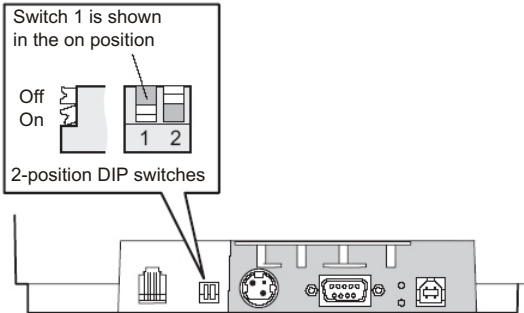
Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

- Open the receipt cover and check if there is paper in the printer. If not, follow the instructions for loading paper.
- Turn the printer so the back is facing you.
- Set DIP switch 1 to the On position (down).

Open the receipt cover and press the reset button while holding the paper feed button.

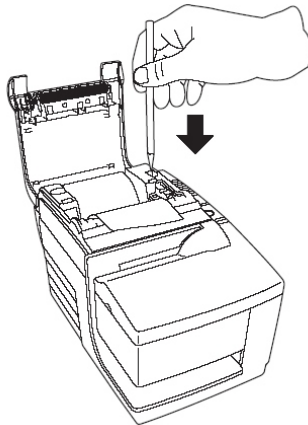
The printer beeps, prints the diagnostic form and the configuration main menu.

The printer pauses and waits for a main menu selection to be made (see sample printout below.)



back of printer

- Follow the printed instructions on the scrolling menu by pressing the paper feed button as indicated below to make selections.



Indicate Yes with a long click. (Press and hold paper feed button for more than one second.)

Indicate No with a short click. (Press paper feed button quickly.).

- Continue through your menu selections until you are asked, "Save New Parameters?" Select "Yes" or "No".

CONFIGURING THE PRINTER

If you wish to save, select “Yes”, then return DIP switch 1 to the Off position (up).

Press the reset button. The printer resets with the new selections. You can verify the setting by pressing the paper feed button to print out a diagnostics form or by holding the paper feed button and opening and closing the receipt cover.

- If you would like to continue configuring the printer, select “No”. The printer returns to the configuration menu where you can set parameters again.

```
*** Printer Config Menu ***

This config menu allows to set general printer parameters
Sub-menus are entered and selections are made using
the Paper Feed Button :

- short click : Feed Button is quickly depressed
                  then released
- long click  : Feed Button is held down more than
                  1 second then released

CAUTION !!
The settings are predetermined in factory and
should generally not be changed.
If you must change the settings do so carefully
to avoid changing other functions.

*****

*** MAIN MENU ***
***
Select a sub-menu :      Click(s)
- EXIT                  -> 1
- Print Current Configuration -> 2
- Set Communication Interface -> 3
- Set Diagnostics Modes    -> 4
- Set Emulation/Software Options -> 5
- Set Hardware Options     -> 6
- Set Paper Type          -> 7
- Set Firmware Features    -> 8

Enter code, then hold Button DOWN
at least 1 second to validate
```

Communication interface

To change the communication interface settings, enter the configuration menu, select “Set Communication Interface” from the main menu and answer “Yes” to “SET INTERFACE TYPE?” printed on the receipt.



Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the paper feed button as instructed to select the communication interface you want.

- Communication interface
 - RS-232C interface
 - USB (USB or Powered USB)

RS-232C serial interface settings

To change the RS-232C serial interface settings, enter the configuration menu, select “Set Communication Interface” from the main menu and answer “No” to “SET INTERFACE TYPE?” printed on the receipt. This takes you to the instructions for selecting the RS-232C settings.



Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the paper feed button as instructed on the configuration menu to select the RS-232C settings you want to change:

- Baud rate
 - 115200 baud
 - 57600 baud
 - 38400 baud
 - 19200 baud
 - 9600 baud
 - 4800 baud
 - 2400 baud
 - 1200 baud
- Number of data bits can not be changed
- Stop bits can not be changed
- Parity can not be changed
- Hardware flow control
 - Software (XON/XOFF)
 - Hardware (DTR/DSR)
- Data reception errors
 - Ignore errors
 - Print “?”

DIAGNOSTIC MODES

- Alternate DTR/DSR
Enabled Disabled



Press the paper feed button for at least one second to validate the selection.

Diagnostic modes

To change the diagnostic modes enter the configuration menu, select “Set Diagnostic Modes” from the main menu and select one of the following modes:

- Normal: normal operating mode of the printer.
- Datascope: the receipt printer prints incoming commands and data in hexadecimal format to help troubleshoot communication problems.
- Receipt test: the receipt printer prints two code pages to verify proper printing of the receipt.
- Slip test: the slip printer prints two code pages to verify the slip printer is operating properly.
- MICR test mode: the receipt printer prints all characters recognized by the MICR (check reader) to verify proper reading of an inserted check.

Enable or disable data scope mode

The data scope mode test prints a hexadecimal dump of all data sent to the printer: “1” prints as hexadecimal 31, “A” prints as hexadecimal 41 and so on. This helps troubleshoot communication problems and runs during a normal application (after being enabled through printer configuration).



Data scope mode is usually considered a level 1 diagnostic test.

Data scope mode is enabled and disabled by selecting the “Diagnostic Modes” sub-menu of the configuration menu.

Press the paper feed button as instructed on the “Diagnostic Modes Menu” to enable or disable the data scope mode test.

- Off, normal mode (Data scope mode disabled)
- Data scope mode (enabled)



Press the paper feed button for at least one second to validate the selection.

To run the data scope mode

- After you have enabled the data scope mode, exit the configuration menu.
- Run a transaction from the BEETLE or host computer.

All commands and data sent from the BEETLE/host computer will be printed as hexadecimal characters as shown in the illustration.

To exit the data scope mode

- Enter the configuration menu again.
See “Configuring the printer.”.
- Disable the data scope mode.
- Exit the configuration menu.

The printer is once again on-line and can communicate normally with the host computer.

Enable or disable receipt test mode

The receipt test mode verifies proper receipt printing. Receipt test is enabled and disabled by selecting the “Diagnostic Modes” sub-menu of the configuration menu. See “Configuring the printer” for instructions on how to enter the configuration menu.

To exit the receipt test mode

- Enter the configuration menu again. (See “Configuring the printer”)
- Disable the receipt test mode.
- Exit the configuration menu.
- The printer is on-line and can again communicate normally with the host computer.

To run the Receipt test mode

- Enable the receipt test mode in the configuration menu.
- Exit the configuration menu.
- Push the paper feed button. The receipt station prints two code pages and cuts the receipt.
- To repeat this test, push the paper feed button again.

Enable or disable slip test mode

The slip test mode verifies proper printing on a slip. Slip test is enabled or disabled by selecting the “Diagnostic Modes” sub-menu of the configuration menu. See “Configuring the printer” for instructions on how to enter the configuration menu.

DIAGNOSTIC MODES

To run the slip test mode

- Enable the slip test mode in the configuration menu.
- Exit the configuration menu.
- Insert a slip into the slip station.
- Push the paper feed button. Two code pages will be printed.
- To repeat this test, preform steps 3 and 4 again.

To exit the slip test mode

- Enter the configuration menu again. (See “Configuring the printer”)
- Disable the slip test mode.
- Exit the configuration menu.

The printer is on-line and can again communicate normally with the host computer.

Enable or disable MICR test mode

MICR test mode tests the MICR operation. In this mode the MICR reads the characters on a check, but instead of transmitting the values to the software it prints them out.

MICR test is enabled or disabled by selecting the “Diagnostic Modes” sub-menu of the configuration menu. See “Configuring the printer” for instructions on how to enter the configuration menu.

To run the MICR test mode

- Enable the MICR test mode through the configuration menu. Then exit the configuration menu.
- Insert a check into the slip station. (See “Verifying and validating checks”)
- Once a check is detected by the printer, the platen closes and the characters are read by the MICR check reader. The decoded data is printed as characters on receipt paper. The platen is then opened, and the test is re-started.
- The printed characters should match the characters on the check. If the MICR check reader misreads a character, a question mark “?” is printed. If no characters can be read, “NO MICR CHARACTERS” is printed.

To exit the MICR test mode

- Enter the configuration menu again.
- Disable the MICR test mode.
- Exit the configuration menu.

The printer returns to normal mode and can again communicate with the host computer.

Setting the printer emulations and software options

Printer emulations determine what commands are available to the printer. To change the printer emulations settings, select the “Emulations/Software Options” sub-menu of the main menu and answer “Yes” to “Set the Printer Emulations?” printed on the receipt. This takes you to the instructions for setting the printer emulation.

Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the paper feed button for at least one second to validate the selection.

- **Printer Emulation**
Native mode
A756 Emulation
- **Printer ID mode**
This function determines the ID value returned by the printer in response to a Transmit printer ID command (1D 49 n). The printer can be configured to send back the ID of the TH320, TH420, A758 or A756.
- **Carriage return usage**
This function allows the printer to use the carriage return (hexadecimal 0D) command as a print command or to ignore it, depending on the application.

Press the paper feed button as instructed to select the printer emulation you want.

Slip Options

- **Slip eject at receipt select**
When enabled the printer ejects the slip when receipt is selected.
- **Delete Lead Spaces: N Standard Columns**
Sets the TH320 to delete number (N) of leading spaces in the slip format for standard print.
- **Delete Lead Spaces: N Compressed Columns**
Sets the TH320 to delete number (N) of leading spaces in the slip format for compressed print.
- **Compressed Mode: Disabled/Enabled**
Turns on compressed print for all slip printing

SETTING UP THE PRINTER

- Delete Trailing Spaces: Disabled/Enabled
Removes all trailing spaces for slip printing.
- Max Lines Rotated: N lines
Varies the spacing between the rotated print formats to allow printing of more lines.
The setting (N) is changeable from 21 to 25 lines.

Setting Up the Printer

- Printhead setting
This is the printhead energy rating. It must match the rating marked on the front right of the thermal mechanism in the printer.



Do not change printhead setting unless printhead is replaced.

When a new thermal mechanism is installed, be sure this setting matches the indicated energy rating on the mechanism.

- Color density
Adjusts printhead energy level to change color printing or adjust to paper variations. Factory setting is 100%.



Choose an energy level no higher than necessary to achieve a dark printout. Failure to observe this rule may result in a printer service call or voiding the printer warranty. Running at a higher energy level reduces the printhead life. Consult your Wincor Nixdorf technical support specialist if you have any questions.

- Print density (monochrome papers only)
Adjusts printhead energy level to darken printout or adjust for paper variations. When the printer prints high-density color print lines (text or graphics), it automatically slows down. Factory setting is 100%.



Choose a print density setting no higher than necessary to achieve acceptable print density.

Failure to observe this rule may result in a printer service call and may void the printer warranty.
Running at a higher energy level reduces the printhead life. Consult your Wincor Nixdorf technical support specialist if you have questions.

- Power supply wattage (Max power)

You can choose between a 48-watt, 55-watt or 75-watt power supply. This matches the wattage of the printer to the power supply.

48-watt power supply (for older BEETLE systems), 55-watt power supply (standard), 75-watt power supply (Enables printer to optimize speed at higher dot coverage.)

- Alternate reset feature

This feature allows you to reset the TH320 by opening and closing the front cover instead of using the dip switch or reset button.

- Paper low sensor

Allows the user to enable or disable the paper low sensor.

- MICR

Allows the user to enable or disable the MICR to read checks.

- MICR dual pass option

This feature when enabled allows the printer to attempt a second reading of the check MICR number, if the first attempt was unsuccessful.

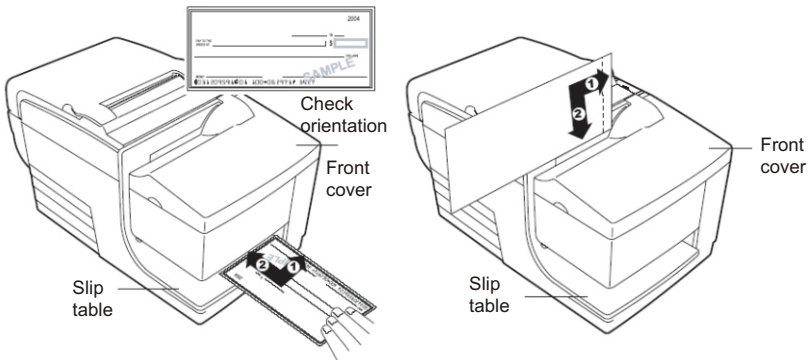
Using the Printer

Printing on forms or checks

Several types of transactions may require the insertion of a check or other form into the printer:

- Credit card transaction (requiring a merchant verification or authorization slip)
- Multiple-part forms such as credit transactions or merchandise returns
- Electronic funds transfers
- Electronic check
- Check printing (printing the date, payee, and amount on the check face)
- Check endorsement

The TH320 can also print on multi-part forms up to four parts thick. Use either the front insertion or drop in method, described below.



Front insertion method

- Insert the form or check (as shown on the left above) from the front and place it on the slip table with the print side up. If the form is extra long, you may need to insert it from the side. A slight resistance may be felt when the form comes in contact with the form stop.
- Slide the form or check to the right until it aligns against the check guide.
- Slide the form or check toward the top of the printer until the green slip-in light on the top cover turns on. This indicates that both sensors are covered.

- Follow the instructions from the host computer. The printer begins printing.
- Remove the form or check after it has been ejected.
- Follow the instructions from the host computer to finish the transaction.

Dropin method

- Insert the form or check (as shown on the right above) into the slot from the top or side with the print side toward you. A slight resistance may be felt when the form comes in contact with the form stop.
- Move the form or check to the right until it is aligned against the right edge of the slot.
- Slide the form or check downward until the green slipin light on the top cover turns on. This indicates that both sensors are covered.
- Follow the instructions from the host computer. The printer begins printing.
- Remove the form or check after it has been fed back out.
- Follow the instructions from the host computer to finish the transaction.



See the next page for proper insertion of multi-part forms.

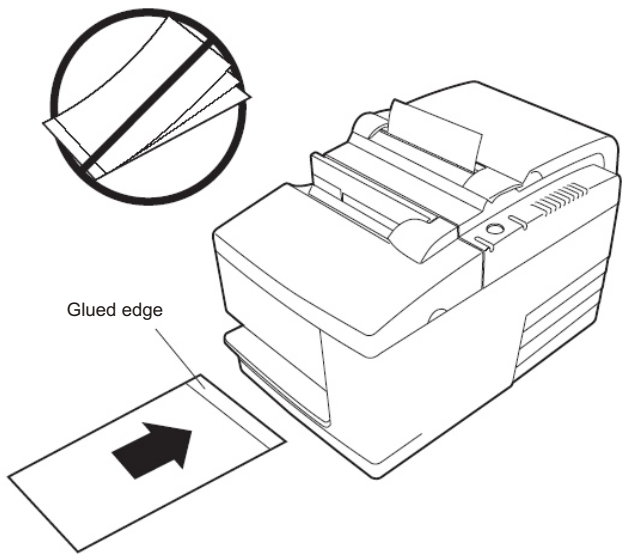
Proper insertion of multi-partforms

Be sure to insert multi-part forms glued-edge-first as shown in the drawings on this page, whether inserting the form from the front, top or side.

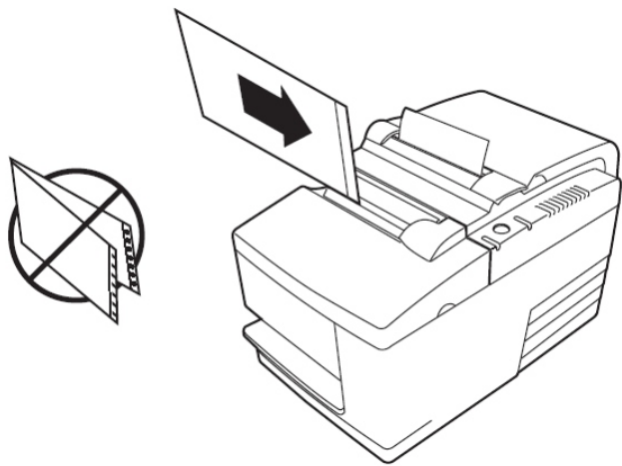


Failure to insert multi-forms properly can result in costly paper jams and damage to the form.

PRINTING ON FORMS OR CHECKS



Front insertion printing - glued edge leading



Top or side slip-in printing - No perforation holes to right side

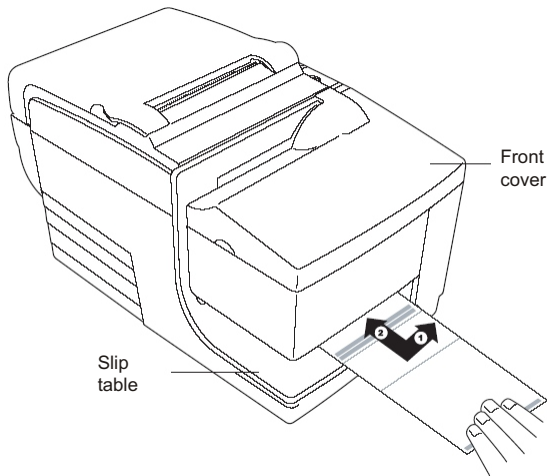
Verifying and validating checks (optional)

The printer's MICR check reader enables check verification and validation by inserting the check from either the front or the top of the printer.



To ensure that checks are properly verified and validated, they must be free of folds and wrinkles and inserted correctly into the MICR printer. Smooth a wrinkled or folded check for best performance.

Check orientation - face down
Do not fold check



To verify and validate a check inserted from the front:

- Place the check face down on the slip table, with the bottom edge of the check to the right. Move the check to the right so it aligns along the check guide.
- Slide the check straight forward into the printer until the green slip-in light on the top right edge of the printer comes on, indicating both sensors are covered.

VERIFYING AND VALIDATING CHECKS (OPTIONAL)



Hold the check to the right, against the check guide and release it as soon as the printer begins to run.

- Follow the instructions on the host computer to complete the MICR process:

Upon instruction from the host, the check is fed into the printer, read and backed out to a position ready for endorsement, if desired.



If the terminal indicates an incorrect read of the MICR:

Remove the check.

Reinsert the check, following steps 1, 2, and 3.

- Remove the check only when it is fully released by the printer.
- Continue to follow the instructions from the host computer to finish the transaction.

Tips for Avoiding Problems

Prevent over heating of the printhead

Overheating of the thermal printhead is one of the most common causes of serious printer problems.

To prevent overheating, certain duty cycle restrictions need to be applied because of the heat generated by the thermal printhead, particularly when it is printing logos. Certain limits we can apply are: ambient temperature, the percentage of time of continuous solid printing (measured against one minute), and the percentage amount of coverage.

To avoid overheating do one or more of the following:

- Reduce the amount of coverage.
- Reduce the time of continuous solid printing.
- Reduce the ambient temperature.

Keep in mind that the ambient temperature may be adversely affected by direct exposure to sunlight or close proximity to other sources of heat.



If the duty cycle exceeds the limits shown in the table below, the receipt printhead will heat up and shut down. This may damage the printhead.

Allowable duty cycle (measured over one minute of continuous printing)

Amount of solid coverage		Ambient temperature	
	25° C (77° F)	35° C (95° F)	50° C (122° F)
20%	100%	50%	20%
40%	50%	25%	10%
100%	20%	10%	4%

TIPS FOR AVOIDING PROBLEMS

Duty cycle

Percentage of time that the specified “Amount of solid coverage” can be printed during a one minute period of time.

Example:

at 20% solid coverage, 35° C temperature, a 50% duty cycle is to be used, resulting in 30 seconds of printing and 30 seconds without printing.

For reference

A typical receipt with text (contains some blank spaces) is approximately 12% dot coverage.

A full line of text characters (every cell on the line has a character in it) is approximately 25% dot coverage.

- Graphics are approximately 40% dot coverage.
- Barcodes are approximately 50% dot coverage.
- A solid black line is 100% dot coverage.

Avoid Harsh Environments

The TH320 printer is a durable piece of equipment and can withstand a range of physical environments. However, the printer's internal mechanical components are vulnerable to airborne contaminants, particularly in certain harsh areas, such as home improvement stores, garden shops, and warehouse environments. The printer can become inoperative rapidly in these kinds of environments, if routine cleaning is not performed.

To prolong the serviceability of your printer in these harsh environments, we recommend to upgrade with harsh environments kit and regular periodic inspection and general cleaning of the MICR read head, sensors, carriage shaft and both printer mechanisms.

Troubleshooting

The simple design of TH320 requires virtually no periodic servicing. However, if problems do occur, they can usually be diagnosed readily by checking the light status indicators, below, then referring to appropriate section of the Troubleshooting guide on the pages that follow.

Status Indicators

The on-line, paper status, error light is the light to the rear, on the top edge of the printer. It may be the first indication that something is wrong.

The light closer to the front on the right edge of the printer indicates that a form is inserted properly. It does not indicate an error.

For some unexpected conditions, the printer communicates the information to the host computer and relies on the application to indicate what the condition is.

The information on the following pages describes common conditions that you could encounter and easily fix yourself. A few may require that you contact a service representative.

You should be able to correct many of the conditions locally without calling for service. However, if a condition persists, contact a service representative. See “Contacting a service representative” at the end of this chapter.

Typical Remedy Procedure

If an unexpected condition has occurred, take the following general steps:

- Cycle the power of the printer and note its behavior.
- Check the on-line, paper status, error light and compare its behavior to the following table.
- Test the receipt printer or slip printer by printing a sample test print as described elsewhere in this document.
- Determine if the condition is with the thermal receipt printer or the impact slip printer and refer to the tables on the following pages.

STATUS INDICATORS

Light behavior	Printer status
Off	No power
Fast blink	Firmware download
Fast blink	Level 0 diagnostics (occurs at power on and on reset)
Fast blink	Cover open (receipt or slip) Paperout Carriage jam Slip jam Knifejam
Slow blink	Paper low Temperature error Voltage error
Steady On	All other states

Printer beeps

Condition	Possible causes	What to do
Printer beeps in a single, double, or triple pattern at first power on. The on-line, paper status, error light blinks in the same pattern, and the printer won't power up.	The printer has a problem with its electronics.	Contact a service representative.
Printer beeps during normal operation.	The printer may be programmed to beep during normal operation by the software application used on the host computer.	Consult your application software manual.

Printer will not print

Condition	Possible causes	What to do
The on-line, paper status, error light is blinking and the printer won't print.	The receipt paper may be out, the cover open, the knife jammed, the supply voltage out of range, or the print head temperature out of range.	Check that the receipt paper is properly loaded and covers are closed. See the table at the beginning of this section. If problem continues contact a service representative.

Printer doesn't have power (light not on)	Power supply may be defective.	If the power supply is plugged in, but does not come on, you need to order a new power supply. See "Power supply and power cords."
Printer has power but doesn't print.	<p>Cables may not be connected properly.</p> <p>DIP switches not set correctly.</p> <p>All other causes.</p>	<p>Check all cable connections. Check that the host computer and power supply are both on (the power supply is turned on by plugging it into an outlet). See "Connect the cables."</p> <p>Check the switch setting. DIP switch one should be off (up) for normal operation.</p> <p>Contact a service representative.</p>

On-line, paper status, error light flashes

Condition	Possible causes	What to do
The on-line, paper status, error light is blinking and the printer won't print.	<p>Receipt paper is out. Change the paper now. Do not run a transaction without paper. Data may be lost.</p> <p>Receipt or front cover is open.</p> <p>The knife is jammed.</p> <p>The slip is jammed.</p> <p>The carriage is jammed.</p> <p>Receipt paper is low.</p>	<p>Receipt paper is out. Change the paper immediately. See "Load and change the receipt paper."</p> <p>Close the cover. The printer can not operate with any of the covers open.</p> <p>Open the receipt cover and check the knife. Do not force the cover if it will not open. Clear any jammed paper you can see. Tear off any excess paper against the tear-off blade.</p> <p>Open the front cover and clear paper from path.</p> <p>Open front cover and clear paper from path.</p> <p>There are about 4.5 meters, \pm 3 meters, (15 feet, \pm 10 feet) of paper left. Change the paper soon to avoid running out of paper part way through a transaction. See "Load and change the receipt paper."</p>

STATUS INDICATORS

The on-line, paper status, error light is blinking and the printer won't print.	Thermal print head temperature is out of range.	The print head may overheat when printing in a room where the temperature is above the recommended operating temperature or when printing high density graphics continuously, regardless of the room temperature. In either case, the printer will shut off. If the temperature of the print head is too hot, adjust the room temperature or move the printer to a cooler location. If the print head is overheating because of printing high density graphics continuously, reduce the demand on the printer.
	AC supply voltage is out of range.	If paper is not low and no conditions indicate that the thermal print head is too hot, the power supply voltage is out of range. Contact a service representative.

Slip-in/light does not operate

Condition	Possible causes	What to do
Light does not operate	No check or form inserted into printer. Check or form incorrectly inserted.	Ensure the check or form is aligned properly. See "Printing on forms or checks."

Check print quality poor

Condition	Possible causes	What to do
Printer starts to print, but stops while form is being printed.	Communication error or software error.	Check the interface cable. Check that the software is working properly.

Forms print is light or spotty.	Form not inserted in correctly.	See "Printing on forms or checks."
	Impact print head is dirty or defective.	Contact a service representative.
	Improper platen gap.	Contact a service representative.
	Ribbon cassette is defective	See "Installing or replacing the ribbon cassette."
Ribbon cassette is worn.	Replace the ribbon cassette.	See "Installing or replacing the ribbon cassette."
Light print, smudging, or slip skews.	Platen gap needs adjustment.	Contact a service representative.

Receipt print quality poor

Condition	Possible causes	What to do
Colored stripe on receipt.	Paper is low.	Change the paper.
Receipt does not come out all the way.	Paper is jammed.	Open the receipt cover, inspect the knife, and clear any jammed paper.
Printer starts to print, but stops while the receipt is being printed.	Paper is jammed.	Open the receipt cover, inspect the knife, and clear any jammed paper.

STATUS INDICATORS

Print is light or spotty.	Paper roll loaded incorrectly.	Check that the paper is loaded properly.
	Thermal printhead is dirty.	Use recommended thermal receipt paper. Clean the thermal printhead with an alcohol pen prior to going back to an approved paper. Do not spray the thermal printhead with household cleaner as this may damage it and the electronics. The thermal printhead does not normally require cleaning if the recommended paper grades are used. If non-recommended paper has been used for an extended period of time, cleaning the printhead with an alcohol pen will not help.
	Printhead is defective.	Contact a service representative.
Color print is light.	Variations in paper.	Increase energy level of printhead in "Color Density Adj" of the printer configuration menu (see "Configuring the printer" section).
	Incorrect paper setting	Check diagnostics setting.
Inconsistent printing, no two-colorprint.	Paper type used and papertype setting do not match.	Print diagnostic form and verify paper type setting to type 0, 1, 4, or 5 (see "Configuring the printer" section)
Vertical column of print is missing, one side of receipt is missing, or top or bottom half of characters are missing.	Printhead is defective.	Contact a service representative.
	Incorrect printhead setting	Check diagnostics setting

Slip station and MICR problems

Condition	Possible causes	What to do
Slip-in light does not come on.	Form or check not inserted properly.	Line up the form or check against the check guide (wall) and slide it toward the front of the printer until it is visible from the top (the light should come on). Extra long forms may need to be inserted from the side to disengage the Form Stop. See "Printing on forms or checks" section or "Verifying and validating checks" section.

Forms or checks skew or catch in the slip station.	There is an obstruction or paperjam in the slip station.	Open the front cover and check for paper jams or other obstruction in the slip station. Clear the jammed paper or obstruction.
The MICR check reader does not read or misreads checks.	<p>The check is inserted improperly.</p> <p>The check is fraudulent.</p> <p>A nearby magnetic source is interfering with the check reader.</p>	<p>Make sure the check is inserted properly with the MICR characters down. See "Verifying and validating checks" section.</p> <p>Make sure that the check is not fraudulent. On fraudulent checks, the characters the printer reads may be different from those that are visible on the check face.</p> <p>Devices, such as CRT monitors, security devices or large metal surfaces near the printer can affect the printer's magnetic field, causing intermittent errors when the MICR check reader is operating. Move the printer away from such items.</p>

The knife does not operate

Condition	Possible causes	What to do
Receipt is not cut	Paper is jammed	Open the receipt cover, inspect the knife, and clear any jammed paper.
	All other problems.	Contact a service representative.

Other conditions

The following problems all need to be corrected by a qualified service representative.

- MICR check reader not operating properly
- Forms not feeding into the slip/forms area properly
- Missing dots in slip or forms printing
- Printer will not cycle or stop when required
- Illegible characters
- Paper will not feed
- Knife will not cycle or cut
- Platen will not open or close
- Printer will not communicate with the BEETLE/host computer

